OIL CROPS: SESAME AND SUNFLOWER SUBNETWORKS

PROCEEDINGS OF THE JOINT SECOND WORKSHOP HELD IN CAIRO, EGYPT, 9–12 SEPTEMBER 1989
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Esta serie incluye ponencias de reuniones, informes internos y documentos técnicos que pueden posteriormente conformar la base de una publicación formal. El informe recibe distribución limitada entre una audiencia altamente especializada.
OIL CROPS:
SESAME AND SUNFLOWER SUBNETWORKS

Proceedings of the Joint Second Workshop
held in Cairo, Egypt, 9–12 September 1989

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In September 1989, the Sunflower and Sesame subnetworks held their bi-annual meetings in Cairo, Egypt. The meetings were well attended and papers, presented in these proceedings, provide a very informative overview of some of the cropping systems, management practices, production constraints and research highlights for both crops in several countries.

Chronic edible oil deficit is a major problem facing many developing countries in Africa and Asia where most countries are forced to import large quantities to satisfy the requirements of their growing populations. With the present rates of population increase and the improvement of nutrition standards it is likely that the consumption of edible oil will rise over the years, increasingly drawing on scarce foreign exchange for the importation of this vital food staple. For this reason, several countries have opted to increase self-sufficiency in edible oil.

Production deficits are due to a number of factors, among which neglect in oilcrops research, in both developed and developing countries has been a major one. This is particularly true for minor crops such as sesame. In the context of the IDRC oilcrops network, initiated in 1981, the interchange of information and the sharing of results between scientists have proved to be very useful and beneficial for the generation of scientific knowledge and the stimulation of research in this important area. It is hoped that conclusions and recommendations of this meeting will stimulate further research and development in the future.

A second important reason for limited national production has been the exceptionally low levels of world prices for oils and fats in the 1980's and the comparative advantage of importation over production for developing countries. The description of a case study using a system's approach to analysis the Vegetable Oil/Protein System of Kenya has stirred much interest during the Cairo meetings and it is hoped that similar work can be carried out in other countries in the future.

The Cairo meetings will also unfortunately be remembered as the one which has witnessed the diagnosis of the fatal disease of late Dr. Hiruy Belayneh, Chairman of the Brassica Subnetwork. We will all regret his absence.

On behalf of IDRC and of all participants, I would like to thank the Government of Egypt for its hospitality, the organizers for the excellent arrangements and all those who contributed to the success of these meetings by their presentations and discussions.

Eglal Nached,
Senior Program Officer,
IDRC, Cairo
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There are 14 known diseases of sunflower (*Helianthus annuus, L*) but only 6 are commonly observed, Table 1. We have contended with most of the diseases recorded in the sunflower growing countries. The first known disease was rust (*Puccinia helianthi Schwu.*), which was recorded in 1931. Root-rot incited by *Sclerotium bataticola,* and *Rhizoctonia solani* was reported on sunflower in 1957. Other diseases were, however, observed between 1970 and 1988.

Diseases known to be present in one area may not be found in others. Some destructive diseases in one area may be of little significance in another because of differences in environment or cultivars. Disease occurrence, prevalence, and severity may differ from year to year.

Some of the sunflower diseases; (charcoal rot, leaf spot, root-rot and rust) have been intensively studied in Egypt. Whereas, little work has been done on the other diseases. Therefore, it is important to determine the nature of these diseases, and such factors as soil and climatic conditions. Means for their control should also be established.

### Table 1. List of sunflower diseases in Egypt.

<table>
<thead>
<tr>
<th>Disease</th>
<th>Pathogen</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Charcoal rot</td>
<td><em>Machrophomina phaseolina</em></td>
<td>Major disease</td>
</tr>
<tr>
<td>2. Rust</td>
<td><em>Puccinia helianthi</em></td>
<td></td>
</tr>
<tr>
<td>3. Leaf spots (complex)</td>
<td><em>Alternaria alternata</em></td>
<td></td>
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<tr>
<td></td>
<td><em>Curvularia lunata</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Drechslera rostrata</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>D. spicifera</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Ulocladium botrytis</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>U. septosporum</em></td>
<td></td>
</tr>
<tr>
<td>4. Wilt</td>
<td><em>Fusarium oxysporum</em></td>
<td>Uncommon</td>
</tr>
<tr>
<td>5. Southern blight</td>
<td><em>Sclerotium rolfsii</em></td>
<td>Minor disease</td>
</tr>
<tr>
<td>6. Stalk and head rot</td>
<td><em>Sclerotinia sclerotiorum</em></td>
<td></td>
</tr>
<tr>
<td>7. Powdery mildew</td>
<td><em>Erysiphe cichoracearum</em></td>
<td></td>
</tr>
<tr>
<td>8. Head rot</td>
<td><em>Rhizopus arrhizus</em></td>
<td>Heavy damage on</td>
</tr>
<tr>
<td></td>
<td><em>Aspergillus spp.</em></td>
<td>short cultivars.</td>
</tr>
<tr>
<td>9. Root-rot (complex)</td>
<td><em>Rhizoctonia solani</em></td>
<td>Minor disease</td>
</tr>
<tr>
<td></td>
<td><em>Pythium spp.</em></td>
<td></td>
</tr>
<tr>
<td>10. Verticillium wilt</td>
<td><em>Verticillium dahliae</em></td>
<td></td>
</tr>
<tr>
<td>11. Gray rot</td>
<td><em>Botrytis cinerea</em></td>
<td>Scarce</td>
</tr>
<tr>
<td>12. Black stem</td>
<td><em>Phoma cucaraceae var.</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Helianthi-tuberosi</em></td>
<td></td>
</tr>
<tr>
<td>13. Root-knot</td>
<td><em>Meloidogyne spp.</em></td>
<td>Heavy losses in sandy soil</td>
</tr>
<tr>
<td>14. Bacterial disease</td>
<td><em>Pseudomonas solanacerum</em></td>
<td>Scarce</td>
</tr>
</tbody>
</table>
Charcoal rot as a major disease is found in most of the growing areas in Egypt, where damage ranges between 5 and 80%. Symptoms of the disease start to appear on 35-45 days old plants and are not usually apparent until after flowering. In infested fields, dark discoloration on the outer surface of the stem basal parts is predominant, and premature ripening and drying stalks which bear poor heads are evident. Varieties Giza-1 and Giza-2 were more tolerant to the disease than the other tested ones. The disease affects plant growth and reduces head diameter, total seed yield, 1000 seed weight, and oil content. Depending on environmental conditions and cultivars, the disease can cause 10-30% yield loss. Many trials were carried out on the control of charcoal rot by applying fungicides as seed dressing. Benomyl, Thiophanate-methyl, Vitavax/Thiram and Homai at the rate of 3-5 g/kg seed gave efficient control of the disease.

Rust is one of the major diseases of sunflower in Egypt. It was frequently observed in different governorates in the Delta, Middle Egypt and as far south as Sohag. Moreover, it is prevalent in north western areas and newly reclaimed lands where the spray irrigation is widely applied. From the previously reported four Races, only Race-1 was identified in Egypt. Plantvax, Calixin and Daconil-2787 gave sufficient control to sunflower rust when applied three times at the rate of 0.25%.

Leaf spot diseases were frequently caused by Alternaria alternata, Drechslera spicifera and D. rostrata and to a lesser extent by Ulocladium spp. and Curvularia lunata. Head rot caused by Rhizopus arrhizus always followed by head wounds was severe under moist conditions on short-stem varieties.

Root rot diseases were caused by Rhizoctonia solani, Pythium spp. and Fusarium spp. Powdery mildew caused by Erysiphe cichoracearum occurred on late maturing sunflower. Several cases of Southern blight disease attributed to Sclerotium rolfusi were observed in many fields, mainly in Upper Egypt. Heavy infestation of root-knot nematodes (Meloidogyne spp.) was reported on sunflower grown in sandy soil.

**Selected References on Sunflower Diseases in Egypt**
